

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

REMARKS

This is intended as a full and complete response to the Office Action dated June 12, 2001, having a shortened statutory period for response set to expire on September 12, 2001. Please enter the following amendments and reconsider the claims pending in the application for reasons discussed below.

The Examiner states that the specification does not support a step for depositing any materials in the first layer, except SiC. As noted by the Examiner, in the summary of the invention Applicant list other carbon-containing compounds such as α C, α FC, and SiCOH that are deposited. (pg. 2, lines 14-26) The summary further states that "the plasma treatment is preferably performed in situ following the deposition of the layer to be treated". The summary also states that "the processing chamber in which *in situ* deposition and plasma treatment occurs is configured to deliver the same or similar precursors for the carbon containing layer(s)" (α C, α FC, and SiCOH). Additionally, an example of a second layer that is deposited over the first layer can be found in Example 3 (pg. 10, ln. 17 – pg. 11, ln. 9) and Example 4. (pg. 11, lns. 11-22) Applicant submits that the specification supports the claims of the Application. Withdrawal of the objection is respectfully requested.

The Examiner objects to incorporating subject matter into this application by reference that incorporates another reference. Specifically, U.S. Patent No. 5,000,113 to Wang et al., U.S. Patent No. 4,951,601 to Maydan et al., application Nos. 09/165,248, 09/219,945 and 09/193,920, because these Patents incorporate other Patents and the applications may incorporate other references. MPEP 608.01(p) outlines the PTO's policies on incorporation by reference. Incorporation by reference of "essential material" of a Patent or an application is proper unless said Patent or application also incorporates some of the "essential material" by reference. The subject matter incorporated by the referenced Patents and applications are not considered "essential material" therefore, the incorporation by reference is proper. Withdrawal of the objection is respectfully requested.

The Examiner states that the application contains informalities. Applicant has amended the application to remove the "slash" and further clarified the use of the

acronym "USG" as shown in the amendments above. Withdrawal of the objection is respectfully requested.

The Examiner states that claims 24, 26-27, 30-36, 38-39, 42-43, and 45, stand rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification to reasonably convey to one skilled in the relevant art that the inventors had possession of the claimed invention. The Examiner notes that the specification does not disclose any compound having the chemical formula SiCOH. Additionally, the Examiner is not aware of any compounds having the formulas α FC, SiCOH, or SiCO:H as recited in claims 24 and 34. The Examiner further states that because the Examiner is not aware of said compounds, the specification is not enabling.

SiC, SiCO:H, α FC, α C as used in this application are not intended to be a chemical formula for a compound. Rather, SiC, SiCO:H, α FC, and α C are intended to show that the compounds contain a Si, C; Si, C, O and H; amorphous fluorocarbon; and amorphous carbon, respectively. Applicant submits no new matter was added in claims 24 and 34. Additionally, Applicant submits that SiCO:H is the same as SiCOH since the colon was inserted to show that H is not bonded to O. Therefore, Applicant submits that the application contains an enabling specification, and the inventor had possession of the claimed invention. Withdrawal of the rejection is respectfully requested.

The Examiner states that claims 27, 29-30, 39, and 41-42, are objected to under 37 C.F.R. 1.175(c), as being improper dependent form because of failing to further limit the subject matter of a previous claim. Claims 27, 29, 39, and 41 have been cancelled. Claims 30 and 42 have been amended to remove the introduction of a generic gas. Withdrawal of the objection is respectfully requested.

The Examiner states that claims 24-45 are rejected under 35 U.S.C. § 112, second paragraph as being indefinite for failing to point out and distinctly claim the subject matter which Applicant regards as the invention. Specifically, the Examiner notes that a semiconductor is not required to be used as the substrate or in any step of the claims as set forth in the preambles of the independent claims. Applicant has amended claims 24 and 34 to reflect that the first layer is deposited on a substrate. As the preamble states the substrate is a semiconductor substrate.

The Examiner further states that α FC and SiCOH are not known to exist. As stated above, α FC and SiCOH are not intended to be a chemical formula, rather, it is intended to show that the compound is an amorphous fluorocarbon or it contains a Si, C, O and H, respectively.

In claims 26, 28, 38, and 40, the Examiner states that the relationship between "a He gas plasma" and "a plasma consisting totally of an inert gas" is confusing because "comprises" as used in the dependent claims contradicts the "consisting essentially of" language used in the independent claims. Applicant has amended claims 26, 28, 38, and 40 to more clearly recite the invention.

In claims 30 and 42, the Examiner states that "a gas" does not refer to the gas already introduced in the independent claims. Claims 30 and 42 have been amended to more clearly recite the invention.

In claims 33, 35, and 45, the Examiner states "the composition", "the same" and "the oxidation resistance" lack proper antecedent basis. Claims 33, 35, and 45 have been amended to more clearly recite the invention.

In claims 34, 35, and 36, stand rejected because of "improve" and "improves" language as being vague and indefinite. Examples given in the specification clearly supports this language. In Example 2, the results show treating with a plasma reduce or prevent oxidation. (pg. 9, Ins. 18-20, pg. 10, Ins. 11-14). Example 4 illustrates that the step for treating improves adhesion or prevents delamination. (pg. 12, Ins. 7-13)

In claim 34, the Examiner states the meaning of "step for depositing..." for either the first or second layer is not clear in scope. As stated above, the specification clearly supports the step for depositing in claim 34. Withdrawal of the rejection is respectfully requested.

Claims 33 and 45, stand rejected under 35 U.S.C. § 112, first paragraph as containing subject matter not described in the specification in such a way to convey to a person skilled in the art, that the inventors at the time of the application, had the possession of the claimed invention. Applicant respectfully traverses the rejection.

The specification supports that inert gas treatment of α C, α FC, and SiCOH or SiCO:H will have no changes in composition caused by the plasma treatment. Specifically, specification states the present invention is useful for treating a variety of

materials including carbon-containing layers, such as organic polymeric materials, α C, α FC, SiCO:H, and other carbon-containing materials. (pg. 5, Ins. 22-24) Therefore, there is a support in the specification that there is no composition changes caused by the plasma for all the claimed compounds.

Claims 24, 26, 27, 31, 33-36, 38-39, 43, and 45, stand rejected under 35 U.S.C. § 102(b) or in the alternative 35 U.S.C. § 103(a) over *Nguyen et al.* (U.S. Patent No. 5,549,935) on grounds that *Nguyen et al.* discloses a method for processing integrated substrates including semiconductors. Additionally, the Examiner states that *Nguyen et al.* discloses coating all of the chamber with a polymeric fluorocarbon, where the films exhibit predominately C-CFx binding with a F/C ratio of about 1:1 to about 3:1, therefore, having overlapping stoichiometry. The Examiner notes that the sequence in *Nguyen et al.* is similar and that it teaches positive ion bombardment that creates films with high density that tend to resist taking up oxygen from the air. Applicant respectfully traverses this rejection.

Nguyen et al. discloses a layer of silicon or a metal silicide deposited over a substrate to improve adhesion of a polymeric fluorocarbon film to the substrate. (col. 2, Ins. 30-39) The adhesion is improved by causing bonding of Si or metal silicide layer with the carbon in the polymeric fluorocarbon film. (col. 2, ln. 30 to col. 3, ln. 9.) In other words, *Nguyen et al.* discloses using an inorganic material such as Si or a metal silicide and bombarding the layer to expose dangling silicon bonds to bond with fluorocarbon, an organic material. Additionally, *Nguyen et al.* discloses ion bombardment during deposition of fluorocarbon film. (col. 6, Ins. 2-30.) *Nguyen et al.* does not teach, show, or suggest depositing a first layer on a semiconductor substrate, the first layer comprising a material selected from the group consisting of organic polymeric materials, α C, α FC, SiCOH, and SiC, exposing said layer to a plasma, and depositing a second layer over the first layer as recited in claim 24. Additionally, *Nguyen et al.* does not teach, show, or suggest step for depositing a first layer on a substrate, the first layer comprising a material selected from the group consisting of organic polymeric materials, α C, α FC, SiCOH, and SiC, treating the first layer with a plasma, and depositing a second layer over the first layer as recited in claim 34. As a

consequence, Applicant respectfully requests withdrawal of the rejection and allowance of the claims.

Claims 30-42 stand rejected under 35 U.S.C. § 103(a) over *Nguyen et al.* on grounds that it would have been obviously to one of ordinary skill in the art to optimize the processing conditions for particular reactor configurations. Applicant respectfully traverses this rejection.

Applicant believes that the Examiner is referring to claims 30 and 42 because the claims refer to operating parameters, and not claims 30-42. Regardless, as shown above, the rejection of claims 24 and 34 have been obviated, thus, claims 25-33 and 35-42 that are dependent therefrom are also in condition for allowance. Allowance of the claims is respectfully requested.

Claims 24-25, 27, 29, and 31-33, stand rejected under 35 U.S.C. § 102(b) as being anticipated by *Malaczynski et al.* (U.S. Patent No. 5,458,927). The Examiner states that *Malaczynski et al.* teaches a process with multiple plasma steps in one chamber. Further, the Examiner states a work piece with an aluminum-silicon surface is treated with a plasma of carbon containing gas to cause ion implantation of C to form a layer that comprises silicon carbide as well as aluminum carbide and a layer of graphitic materials. Additionally, the Examiner states that the chamber is then evacuated and filled with argon or other inert gases, and a plasma is formed where the gas sputter clean the graphitic material from the SiC layer. The Examiner further states that the reference also disclosed is a fluid step involving plasma deposition of an amorphous DLC layer.

Malaczynski et al. discloses forming a carbon coating over an aluminum-silicon workpiece by treating the workpiece with an argon gas plasma or an inert gas plasma. (col. 2, ln. 23 to col. 3, ln. 38) The workpiece is an aluminum alloy suitable for use in pistons, and other engines and powertrain components. (col. 2, lns. 19-22) The carbon coating is formed to create a wear resistant carbon coating. (col. 3, lns. 46-58) *Malaczynski et al.* does not, however, teach, show, or suggest treating a layer on a semiconductor substrate. Furthermore, *Malaczynski et al.* does not teach, show, or suggest depositing a first layer on a substrate, the first layer comprising a material selected from the group consisting of organic polymeric materials, α C, α FC, SiCOH,

and SiC nor does *Malaczynski et al.* teach, show, or suggest depositing a second layer over the first layer. Therefore, Applicant respectfully submits that the claims are in condition for allowance and respectfully requests allowance of the claims.

Claims 26, 28, and 30, stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Malaczynski et al.* As shown above, *Malaczynski et al.* does not teach, show, or suggest depositing a first layer on a substrate, the first layer comprising a material selected from the group consisting of organic polymeric materials, α C, α FC, SiCOH, and SiC nor does *Malaczynski et al.* teach, show, or suggest depositing a second layer over the first layer as recited in claim 24. Because claim 24 is believed to be patentable over *Malaczynski et al.*, claims 26, 28, and 30, which depend therefrom are also patentable. Withdrawal of the rejection is respectfully requested.

Claims 24, 26, 27, 30, 33-36, 38-39, 42, and 45, stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Nguyen et al.*, in view of *Itoh et al.* (German Patent No. DE19654737A1). The Examiner states that *Nguyen et al.*'s silicon containing substrate/multilayer are generically inclusive of SiC or SiCOH layers claimed by the application, but specific examples as claimed in the present invention were not included. The Examiner further states that *Itoh et al.* discloses a layer containing Si, O, C and H deposited by CVD and possibly by a plasma process. The Examiner states that it would have been obvious to substitute the Si, O, C, and H layer of *Itoh et al.* for the silicon containing layer that is Ar-plasma treated in *Nguyen et al.* Applicant respectfully traverses the rejection.

As shown above, the rejections based on *Nguyen et al.* has been obviated. Additionally, there is no motivation to combine the organic layer (layer containing Si, O, C, H) of *Itoh et al.* with *Nguyen et al.* because *Nguyen et al.* discloses using an Ar plasma to process an inorganic material and generate dangling silicon bonds that can be combined with the carbon in the fluorocarbon. Again, there is no suggestion to start with an organic polymeric layer as disclosed in the present invention. Therefore, the combination of *Nguyen et al.* and *Itoh et al.* do not teach, show, or suggest exposing a deposited first layer on a substrate, the first layer comprising a material selected from the group consisting of organic polymeric materials, α C, α FC, SiCOH, and SiC nor do the combination of *Nguyen et al.* and *Itoh et al.* teach, show, or suggest step for

depositing a first layer on a substrate, the first layer comprising a material selected from the group consisting of organic polymeric materials, αC , αFC , SiCOH , and SiC . Therefore, Applicant respectfully requests allowance of the claims.

Claims 24, 26-27, 33-34, 36, 38-39, and 45, stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Mori*. The Examiner states *Mori* discloses a process where a coating of an organic polymer or a SOG (spin-on-glass layer of Si oxide that may contain hydrocarbon residue) is treated with a plasma that may initially be made from helium. The Examiner further states that *Mori* does not disclose that another layer is deposited after the plasma treatment. Applicant respectfully traverses the rejection.

Mori discloses a method of removing unnecessary matter on an edge portion at the perimeter of a substrate, where a plasma is used to activate a gas to form active species that can react with unnecessary materials on the edge portion of the substrate. (col. 2, Ins. 32-53) The unnecessary materials include silicon oxide (SOG film may contain residual carbon), organic resist, and polyamide. (col. 6, Ins. 48-53). In other words, the plasma is generated to activate a reactive gas to create the active species and not to expose the first layer to the plasma as in the present application. Further, the Examiner admits that *Mori* does not disclose depositing an additional layer after the plasma treatment. Thus, *Mori* does not teach, show, or suggest exposing a deposited first layer on a substrate, the first layer comprising a material selected from the group consisting of organic polymeric materials, αC , αFC , SiCOH , and SiC , exposing said layer to a plasma, and depositing a second layer over the first layer as recited in claim 24. Additionally, *Mori* does not teach, show, or suggest step for depositing a first layer on a substrate, the first layer comprising a material selected from the group consisting of organic polymeric materials, αC , αFC , SiCOH , and SiC , treating the first layer with a plasma, and depositing a second layer over the first layer as recited in claim 34. Withdrawal of the rejection is respectfully requested.

Claims 24-45 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Nguyen et al.* in view of *Tanabe et al.* The Examiner states that *Tanabe et al.* disclose that the use of SiC as an intermediate on a semiconductor substrate, where the SiC may be deposited by various plasma CVD techniques. The Examiner further states

that it would have been obvious to use materials such as SiC in the process of *Nguyen et al.* Applicant respectfully traverses the rejection.

As described above, the rejections based on *Nguyen et al.* have been obviated. *Tanabe et al.* discloses a diamond being heteroepitaxially deposited on a convex-distorted non-diamond single crystal substrate by vapor phase deposition. A SiC single crystal wafer can be used as a substrate. (col. 10, Ins. 37-50) *Tanabe et al.* when combined with *Nguyen et al.* do not teach, show, or suggest exposing a deposited first layer on a substrate, the first layer comprising a material selected from the group consisting of α C, α FC, SiCOH, and SiC, exposing said layer to a plasma, and depositing a second layer over the first layer as recited in claim 24. Additionally, *Tanabe et al.* when combined with *Nguyen et al.* do not teach, show, or suggest step for depositing a first layer on a substrate, the first layer comprising a material selected from the group consisting of α C, α FC, SiCOH, and SiC, treating the first layer with a plasma, and depositing a second layer over the first layer as recited in claim 34.

In paragraph 18, the Examiner states that *Batha et al.* discloses further plasma CVD techniques of SiC, and *Goel et al.* and *Koike et al.* both teach use of SiC as an underlayer before DLC deposits and teach inert gas plasmas cleaning before coating. Applicant is assuming that the Examiner is continuing to reject the same claims as *Tanabe et al.* and combining these references with *Tanabe et al.* Applicant respectfully traverses the rejection.

As described above, the rejections based on *Tanabe et al.* have been obviated. Therefore, the combination of *Tanabe et al.* with *Batha et al.*, *Goel et al.* or *Koike et al.* are improper. *Batha et al.* discloses a process of fabricating silicon carbide films and membranes with predetermined stress via controlling deposition parameters, and the films are used to fabricate x-ray or E-beam masks and the like. (col. 1, Ins. 5-10) The process comprises introducing gas mixture of silane/helium and ethylene and reacting the gas mixture with a glow discharge. (abstract) *Batha et al.* combined with *Tanabe et al.* do not teach, show, or suggest exposing a deposited first layer on a substrate, the first layer comprising a material selected from the group consisting of α C, α FC, SiCOH, and SiC, exposing said layer to a plasma, and depositing a second layer over the first layer as recited in claim 24. Additionally, *Batha et al.* when combined with *Tanabe et al.*

do not teach, show, or suggest step for depositing a first layer on a substrate, the first layer comprising a material selected from the group consisting of α C, α FC, SiCOH, and SiC, treating the first layer with a plasma, and depositing a second layer over the first layer as recited in claim 34.

Goel et al. discloses a method of edge-preserving, corrosion and erosion resistant coatings made from a class of diamond-like materials and substrates coated therewith. (col. 3, Ins. 15-18) *Goel et al.* is directed to sharp-edged apparatus such as a razor blade. (col. 3, ln. 66 – col. 4, ln. 4) An argon plasma is used to clean the substrates prior to deposition. (col., 8 Ins. 12-23) A substrate is coated with an interlayer of silicon carbide, then coated with a diamond-like nanocomposite. (col. 4, Ins. 5-16) As the Examiner state, *Goel et al.* does not teach, show or suggest treating a layer on a semiconductor substrate. Furthermore, *Goel et al.* combined with *Tanabe et al.* do not teach, show or suggest exposing a deposited first layer on a substrate, the first layer comprising a material selected from the group consisting of α C, α FC, SiCOH, and SiC, exposing said layer to a plasma, and depositing a second layer over the first layer as recited in claim 24. Additionally, *Goel et al.* when combined with *Tanabe et al.* do not teach, show, or suggest step for depositing a first layer on a substrate, the first layer comprising a material selected from the group consisting of α C, α FC, SiCOH, and SiC, treating the first layer with a plasma, and depositing a second layer over the first layer as recited in claim 34.

Koike et al. discloses a method of forming a hard carbon film over the inner surface of a guide bush that is in sliding contact with a workpiece. (col. 1, Ins. 6-11) SiC may be used an intermediate layer and deposited by sputtering, after which a hard carbon film is formed. (col. 7, ln. 60 – col. 8 ln. 26). A plasma of argon or nitrogen is used prior to forming the hard carbon film to clean the inner surface. (col. 14, Ins. 25-36) *Koike et al.* does not teach, show or suggest treating a layer on a semiconductor substrate. Furthermore, *Koike et al.* combined with *Tanabe et al.* do not teach, show or suggest exposing a deposited first layer on a substrate, the first layer comprising a material selected from the group consisting of α C, α FC, SiCOH, and SiC, exposing said layer to a plasma, and depositing a second layer over the first layer as recited in claim 24. Additionally, *Koike et al.* when combined with *Tanabe et al.* do not teach, show, or

suggest step for depositing a first layer on a substrate, the first layer comprising a material selected from the group consisting of α C, α FC, SiCOH, and SiC, treating the first layer with a plasma, and depositing a second layer over the first layer as recited in claim 34.

In conclusion, the references cited by the Examiner, neither alone nor in combination, teach, show, or suggest the method or process of the present invention. Having addressed all issues set out in the Office Action, Applicant respectfully submits that the claims are in condition for allowance and respectfully request that the claims be allowed.

The prior art made of record is noted. However, it is believed that the secondary references are no more pertinent to the Applicants' disclosure than the primary references cited in the office action. Therefore, it is believed that a detailed discussion of the secondary references is not deemed necessary for a full and complete response to this office action. Accordingly, allowance of the claims is respectfully requested.

Respectfully submitted,



Keith M. Tackett
Registration No. 32,008
MOSER, PATTERSON & SHERIDAN, L.L.P.
3040 Post Oak Blvd., Suite 1500
Houston, TX 77056
Telephone: (713) 623-4844
Facsimile: (713) 623-4846
Attorney for Applicant

APPENDIX

IN THE SPECIFICATIONS:

Please replace the paragraph at pg. 6 lines 8 –19, with the following paragraph:

The process regimes yield a SiC material having a dielectric constant of less than 7, preferably about 5 or less, and most preferably about 4.2 or less. To deposit such a SiC layer on a 200 mm wafer, a reactive gas source such as trimethylsilane is flown into a reaction chamber, such as a CENTURA® DxZ™ chamber, without a substantial source of oxygen introduced into the reaction zone, the trimethylsilane flowing at a preferable rate of about 50 to about 200 sccm.[/] Preferably, a noble gas, such as helium or argon, is also flown into the chamber at a rate of about 200 to about 1000 sccm. The chamber pressure is maintained preferably at about 6 to about 10 Torr. A single 13.56 MHz RF power source preferably delivers about 400 to about 600 W to the chamber, preferably about 5.7 to about 8.6 W/in². The substrate surface temperature is preferably maintained at about 300° to about 400° C during the deposition of the SiC and the substrate is preferably located about 300 to about 500 mils from a gas showerhead.

Please replace the paragraph at pg. 9 lines 6 –11, with the following paragraph:

Table 5 shows the results of the plasma treatment of SiC in an ashing compatibility study. A series of specimens with SiC was treated with He or N₂O plasma according to the present invention, using the preferred process parameters described in Tables 1 and 2 above. A specimen of SiC layer was left untreated as a comparison specimen and another specimen deposited an undoped silicon [oxide] glass (USG) layer [(USG)] on the SiC layer as another comparison specimen.

Please replace the paragraph at pg. 11 ln. 17– pg. 12, ln. 1, with the following paragraph:

A series of SiC layers was exposed to the N₂O plasma treatment according to process regimes set forth in Table 2. Specifically, for this example, about 1500 sccm of N₂O gas was flown into the chamber, the chamber pressure was maintained at about 8.5 Torr, a RF power of about 250 W was delivered to the chamber with a substrate temperature of about 350°C to about 400°C and a substrate to gas plate spacing of about 400 mils. In this test, the substrate layers included a 5000-20000 Å thick layer of USG, a 200-1000 Å thick layer of SiC, followed by another USG [oxide] layer deposited thereon, and then capped with a 500 Å layer of nitride material. The SiC layer was treated with the plasma of the present invention prior to deposition of the USG layer. In one set of tests, specimens having a SiC layer were treated with an N₂O plasma for about 20 seconds. On one set of specimens, a 7000 Å layer of USG material was deposited thereon and on another set, a 10000 Å layer of USG material was deposited thereon, each thickness representing typical deposited thicknesses in commercial embodiments. Similar specimens were prepared with similar USG thicknesses deposited thereon with the SiC layer being treated for about 30 seconds instead of 20 seconds. Each set was examined for delamination under an optical microscope after about 1 hour, 2 hours, 3 hours, and 4 hours of annealing. Even with an annealing temperature of 450° C, the specimens showed no delamination.

IN THE CLAIMS

24. (Amended) A method of processing a semiconductor substrate, comprising:
 depositing a first layer on the semiconductor substrate, the first layer comprising a material selected from the group consisting of organic polymeric materials, αC, αFC, SiCOH, and SiC; [and]
 exposing the first layer to a plasma consisting essentially of an inert gas; and
 depositing a second layer over the first layer.
26. (Amended) The method of claim 24, wherein the [plasma] inert gas is [comprises a] He [gas plasma].

28. (Amended) The method of claim 25, wherein the [plasma] inert gas is [comprises a] He [gas plasma].

30. (Amended) The method of claim 24, wherein exposing the first layer to the plasma comprises generating the plasma by flowing [a] the inert gas into a processing chamber at a rate of about 100 to about 4000 sccm, establishing a chamber pressure between about 1 to about 12 Torr, applying RF power to an electrode of the chamber to provide a power density of about 0.7 to about 11 W/in².

31. (Amended) The method of claim 24, wherein the exposing the first layer to the plasma and the depositing the first layer are [is] performed in a single process chamber.

32. (Amended) The method of claim 25, wherein the exposing the first layer to the plasma and the depositing the first layer are [is] performed in a single process chamber.

33. (Amended) The method of claim 24, wherein the [composition of the first layer is substantially the same prior to and subsequent to] exposing the first layer to the plasma does not substantially change composition of the first layer.

34. (Amended) A method of processing a semiconductor substrate, comprising:
step for depositing a first layer on a semiconductor substrate, the first layer comprising a material selected from the group consisting of organic polymeric materials, α C, α FC, SiCOH, and SiC;

[step for] treating the first layer with a plasma consisting essentially of an inert gas [to improve the adhesion of a second layer over the first layer]; and

[step for] depositing [the] a second layer over the first layer.

35. (Amended) The method of claim 34, wherein the [step for] treating the first layer improves the oxidation resistance of the first layer.

36. (Amended) The method of claim 34, wherein the [step for] treating the first layer prevents delamination of the second layer from the first layer.
38. (Amended) The method of claim 34, wherein the [plasma] inert gas is [comprises a] He [gas plasma].
40. (Amended) The method of claim 37, wherein the [plasma] inert gas is [comprises a] He [gas plasma].
42. (Amended) The method of claim 34, wherein the [step for] treating the first layer comprises exposing the first layer to the plasma generated by flowing [a] the inert gas into a processing chamber at a rate of about 100 to about 4000 sccm, establishing a chamber pressure between about 1 to about 12 Torr, applying RF power to an electrode of the chamber to provide a power density of about 0.7 to about 11 W/in².
43. (Amended) The method of claim 34, wherein the [step for] treating the first layer and the step for depositing the first layer are performed in a single process chamber.
44. (Amended) The method of claim 37, wherein the [step for] treating the first layer and the step for depositing the first layer are performed in a single process chamber.
45. (Amended) The method of claim 34, [wherein the composition of the first layer is substantially the same prior to and subsequent to] the treating step does not substantially change composition of the first layer.